

CURRICULUM VITA

Name Stephen A. Burns

Address Schepens Eye Research Institute
20 Staniford St.
Boston, MA 02114

Place of Birth ---

Education:

--- B.S., Lehigh University
--- Ph.D., Biophysics The Ohio State University

Postdoctoral Training

--- Post-Doctoral Fellow, Eye Research Laboratories, The University of Chicago

Academic Appointments:

--- Graduate Teaching Assistant, Zoology, The Ohio State University
--- Research Assistant in Biophysics, The Ohio State University
--- Research Fellow in Ophthalmology, The University of Chicago.
1979-1980 Clinical Instructor in Ophthalmology, The University of Pittsburgh
1980-1984 Clinical Assistant Professor of Ophthalmology, The University of Pittsburgh
1984-1987 Assistant Professor of Ophthalmology, The University of Pittsburgh
1987-1992 Associate Scientist, Eye Research Institute
1988- Instructor, Department of Ophthalmology, Harvard University
1992- Senior Scientist, Schepens Eye Research Institute
1993-1997 Associate Director, Schepens Eye Research Institute
2000-2005 Associate Professor, Department of Ophthalmology, Harvard University
2004- Visiting Professor, College of Optometry, Indiana University

Hospital Appointments

1979-1987 Electrophysiologist, The Eye and Ear Hospital of Pittsburgh,
1979-1987 Adjunct Medical Staff, The Eye and Ear Hospital of Pittsburgh

Other Professional Positions

- 1979-1987 Directed Visual Testing Service for the Eye and Ear Hospital of Pittsburgh
- 1987-1989 Director of Psychophysics, The Retina Associates

Honors

- 1993 Fellow, Optical Society of America

Major Committee Assignments:

National

- 1982,1992,99 Extra-Mural reviewer for the National Science Foundation.
- 1983 Extra-Mural reviewer for the Air Force Office of Research
- 1984 Consultant for The Air Force Office of Technology Assessment
- 1987 Extra-Mural reviewer for the National Research Council of Canada
- 1990 Member of Program Committee, "International Scientific Meeting on ARMD."
- 1985-91,93-00 Ad-Hoc reviewer for NIH
- 1998,2000 Extramural Reviewer for Austrian National Science Fund
- 2000-2001 Site Visit Team, Center for Adaptive Optics, The National Science Foundation (chair 2001).
- 2000-2004 Visual Sciences C Study Section
- 2001-2004 Fight for Sight ARVO Review Panel
- 2001-2004 Consultant, Ophthalmic Devices Advisory Panel, Food and Drug Administration.
- 2003-2005 Associate Member, National Science Foundation's Center for Adaptive Optics.

Regional

- 1988-1993 External member, Institutional Review Board, New England College of Optometry

University of Pittsburgh

- 1983-1987 University of Pittsburgh Center for Neuroscience
- 1983-1987 University of Pittsburgh Biomedical Engineering Group
- 1983-85 Member of Eye Research Core grant committee, University of Pittsburgh
- 1985-1988 Director of Retina Research Study Group, Dept of Ophthalmology, Pittsburgh PA.
- 1985-87 Biomedical Engineering Curriculum group, University of Pittsburgh.

Schepens Eye Research Institute

1988	Major Equipment Grant Committee, Eye Research Institute
1988-1990	Co-Director of Retina Seminar Series, Eye Research Institute
1990-91	Member, Grants Administrator Search Committee, Eye Research Institute
1992-93	Lions Club Grant Committee, Schepens Eye Research Institute.
1988-99	Program Director for Macular Disease Research Center, Schepens Eye Research Institute
1990-1998	Chair- Institutional Review Board, The Schepens Eye Research Institute.
1994-1995	Member, Technology Transfer Committee, The Schepens Eye Research Institute (vice chair 2001).
2001-2003	
1994-1996	Chair- Ad Hoc Committee on Indirect Costs, The Schepens Eye Research Institute.
1994-1998	Member, Appointments and Promotions Committee, The Schepens Eye Research Institute.
1994-1998	Member, Trustee Nominating Committee, The Schepens Eye Research Institute
1995-98	Member, Search Committees for faculty in Molecular Biology of the Retina, Molecular Immunology, Immunology of Retinal Transplantation, Developmental Genetics of the Retina.
1996-97	Member, Internal Communications Committee, The Schepens Eye Research Institute
1997- 00	Member, Research Review and Planning Committee, The Schepens Eye Research Institute
1998-2001	Member, Strategic Planning Committee, The Schepens Eye Research Institute
1999-2001	Member, Library Committee
1996-2003	Director of Computer Resources, Chairman of the Computer Committee, The Schepens Eye Research Institute.
1998-2003	Member, Seminar Committee, The Schepens Eye Research Institute (Chairman of Broadhurst Distinguished Lecturer Committee –2001, 2002)
1999-2001	Chairman, Computer System Strategic Planning, The Schepens Eye Research Institute.
2001-2003	Member, Senior Management Group, The Schepens Eye Research Institute.

Harvard Medical School

- 1997-1998 Member, Department of Ophthalmology Retreat Committee
- 1997-98 Member, Harvard Department of Ophthalmology Clinical Research Committee, Harvard University
- 1998-2002 Member, Joint Governing Committee, Joint Clinical Research Center, Massachusetts Eye and Ear Infirmary, Schepens Eye Research Institute (Chairman, 2000).
- 2000-2002 Biophysics Search Committee, Wellman Institute for Photobiology, Department of Dermatology

Membership and Offices in Professional Societies

- 1978- Association for Research in Vision and Ophthalmology
- 1978- The Optical Society of America
- 1984-1988 Technical Program Committee for "Noninvasive Assessment of the Visual System" meeting, Optical Society of America.
- 1986-1998 International Research Group on Color Vision Deficiencies
- 1986-1987 Program Chairman for "Noninvasive Assessment of the Visual System" meeting, Optical Society of America.
- 1987 Symposium Organizer "Advances in Physiological Imaging" Optical Society of America Annual Meeting, 1988
- 1987-1995 Technical Program Committee for the Annual Meeting of the Optical Society of America.
- 1987-1988 General Chairman, for "Noninvasive Assessment of the Visual System" meeting
- 1988-1990 Vice Chair of Medical Optics Technical Group, Optical Society of America.
- 1988-1994 Advisory Committee for "Noninvasive Assessment of the Visual System." meeting (Chair 1989-90)
- 1989-1990 Member- Macular Society Research Committee-Potential Hazards of Laser Photocoagulation Study.
- 1991-1993 Chairman of Medical Optics Technical Group, Optical Society of America.
- 1992-1995 Program Committee "Ophthalmic and Visual Optics" Meeting.
- 1993-1995 Optical Society Representative to the Program Committee: "Vision Science and its Applications"
- 1993-1994 *Chairman* of the Vision and Medical Optics Division, Executive Committee of the Technical Council, Optical Society of America.
- 1994-1995 Co-Chair of "Lasers and Optics in Biotechnology" Publication Evaluation Committee of the Optical Society of America.

- 1994-1999 Member, Biomedical Optics ad hoc Committee, Optical Society of America
- 1995 Member "Society Objectives and Policies" committee of the Board of Directors of the Optical Society of America of America.
- 1995-1996 Member, Fellowship Committee, Optical Society of America.
- 1997-2000 Member, Land Prize Committee, Optical Society of America (Chairman, 1999-2000)
- 1998-2000 Member, NuFocus Student Prize Committee, Optical Society of America (Chairman, 1999-2000)
- 1999-2001 Member of Program Committee, "Aging Retina and Early Degeneration"
- 2004-2007 Member, Board of Editors, Optical Society of America

Editorial Boards

- 1987-1992 Co-Editor for *Applied Optics* feature issues on "Noninvasive Assessment of the Visual System"
- 1992-1993 Co-Editor for *Journal of the Optical Society of America A* feature issue on "Noninvasive Assessment of the Visual System"
- 1995-1996 Co-Editor for *Applied Optics* feature issues on "Optical Technology in Biology and Medicine".
- 1995-1998 Associate Editor for Biomedical Optics, *Applied Optics*
- 1999-2003 Editor for Clinical and Applied Vision, *Journal of the Optical Society of America A*, Optical Society of America
- 1999-2002 Co-Editor, Handbook of Visual Optics, Optical Society of America.
- 2004-2007 Editor, Journal of the Optical Society A.
- Ad Hoc Reviewer for: *American Journal of Ophthalmology*, *Applied Optics*, *Archives of Ophthalmology*, *Clinical Vision Sciences*, *Color Research and Applications*, *Current Eye Research*, *The International Research Group on Color Vision Deficiencies*, *IEEE Biomedical Engineering*, *Investigative Ophthalmology and Visual Science*, *Journal of Glaucoma*, *Journal of the Optical Society of America*, *Journal of Refractive Surgery*, *Journal of Vision*, *Optometry and Visual Science*, *Ophthalmic and Physiological Optics*, *Optics Letters*, *Optics Express*, *Optical Engineering*, *Perception and Psychophysics*, *Vision Research*, *Visual Neuroscience*

Research Interests

Color Vision, Physiological Optics, Human visual electrophysiology, Ophthalmic Imaging, Optics, Age Related Macular Degeneration, Non-Invasive Measurement of the Visual System

Research Funding Information

1982-1983	NEI RO3 EY04347	Principal Investigator, "A New Test of Photopigment Kinetics"
1982-2006	NEI- RO1 EY04395	Principal Investigator, "Investigations of Human Cone Pigment Kinetics"
1987-2005	NEI R01 EYO7624	Co-Investigator, "Spatial Extent of Retinal Damage"
1987-1988	---	Principal Investigator, "Psychophysics Program"
1991-92	----	Principal Investigator, "Photoreceptor Alignment"
1992-1994	---	Investigator, "Macular Degeneration Research Center"
1992-1995	NEI R41 EY09015	Investigator, "Laser Anomaloscope"
1997-98	---	Investigator
1994-95,97-98	---	Co-principal Investigator, "Photoreceptor Alignment"
1997-2001	Department of Energy	Co-Investigator, "Center of Excellence in Laser Medicine"
1998-	---	Principal Investigator "Optical Image Processing"
1998-2002	NEI EY12178 SBIR, Phase I and II	Consultant, "Early Detection of Age-related Macular Degeneration by MSLT,"
1999-2002	---	Consultant "Development of a next generation spatially resolved refractometer."
2000-2002	---	Co-Principal Investigators "Técnicas de las células fotoreceptoras y alta resolución de imágenes retinianas en dégeneration"
2002-2007	NEI- R01 EY14106 Bioengineering Research Partnership	Live microscopy and cytometry in vascular biology (Subcontract PI, Charles Lin, overall PI).
2003-2008	NEI – RO1 EY14375	Adaptive Optics Instrumentation for

Bioengineering
Partnership

Advanced Ophthalmic Imaging.
(Subcontract PI, --- overall PI)

Teaching

--- Teaching Assistant, Department of Zoology, The Ohio State University

1979-1987 Lecturer in the University of Pittsburgh's Ophthalmology Resident Training Program

1979-1986 Lecturer in the Carnegie-Mellon University Biomedical Engineering Course on Sensory Processes

1980-1984 Lecturer in the University of Pittsburgh's Medical Neuroscience course

1980-1981 "Measurements of Eye Movements" Lectures given to the University of Pittsburgh continuing education course "Clinical Evaluation of the Vestibular System"

1984-1987 Lecturer in the Carnegie-Mellon "Introduction to Biomedical Engineering Course"

1984 Lecturer in the University of Pittsburgh's Health Related Professions "Introduction to Neuroscience" Course

1985-1987 Student Supervisor, Carnegie-Mellon Sensory Processes Course

1985-1987 Organized Seminar Series for the Sensory Processes Discussion Group

1986-1987 Medical Student Research Preceptor, -----

1987 Lecturer, resident training program, St. Francis Hospital Ophthalmology

1989, 94, 99 Guest Lecturer, Graduate Seminar on Color Vision, Psychology Department, Northeastern University.

1990 Member, Ph.D. Committee, ---, Northeastern University.

1990-91 Postdoctoral Preceptor, ---.

1992 Instructor, "Advanced Imaging Techniques for Ophthalmic Photographers", Santa Barbara, CA, June, 1992.

1991-92 Postdoctoral Preceptor, ---

1993-96 Postdoctoral Preceptor, ---

1995-1998 Postdoctoral Preceptor, ---

1997-1999 Postdoctoral Preceptor, ---

1997 Visiting Student Preceptor ---

1998-2002 Postdoctoral Preceptor, ---

1999-2001 Postdoctoral Preceptor, ---

2000	Ph.D. Thesis Committee, ---
2001-2002	Postdoctoral Preceptor, ---
2001-2002	Postdoctoral Preceptor, ---
2002-2003	Predoctoral Lab Advisor, ---
2002-2003	Predoctoral Lab Advisor, ---

Bibliography

Patents

1. Webb, R.H. Burns, SA. Penney, M, "Coaxial Spatially Resolved Refractometer" United States Patent 6,000,800, 1999.
2. Webb, R.H. Burns, SA. Penney, M, "Coaxial Spatially Resolved Refractometer" United States Patent 6,099,125 2000.
3. Burns, SA, Webb, RH "Methods and Apparatus for Measurement and Correction of Optical Aberration" 6,486,943, 2002.
4. Elsner; AE.; Burns; SA; Dreher; AW; Webb, RH." Imaging apparatus and methods for near simultaneous observation of directly scattered light and multiply scattered light" United States Patent 6,640,124, 2003

Original Refereed Reports

1. Hill, RM, Ritchie, GD, Bohman, CE, Burns, SA, and Hughes, HC "Retinal blur and the midbrain cell response'. *Experientia*, **15**, 481, 1976.
2. Ingling, CR, Jr., Burns, SA, and Drum, BA "Desaturating blue increases only chromatic brightness". *Vision Research*, **17**, 501-504, 1977.
3. Ingling, CR, Jr., Tsou, BH, Gast, TJ, Burns, SA, Emerick, JE, and Riesenbergl L "The achromatic channel. I: The non-linearity of minimum border and flicker matches". *Vision Research*, **18**, 379-390, 1978.
4. Gast TJ and Burns SA "Detection thresholds for lights of varying purity". *J. Opt. Soc. Am.* **69**, 632-633, 1979.
5. Burns SA, Smith VC, Pokorny J, and Elsner AE "The brightness of equal luminance lights". *J. Opt. Soc. Amer.* **79**, 1225-1231, 1982.
6. Doft BH, Burns SA, and Elsner AE "The inverse electro- oculoqram". *Brit. J. Ophthalmol.*, **66**, 379-381, 1982.
7. Burns S A, Elsner A E, Pokorny J, and Smith VC, "The Abney effect: chromaticity coordinates of unique and other constant hues". *Vision Research*. **24**, 479-89, 1984.

8. Burns S A and Elsner AE, "Color matching at high illuminances: the color-match- area effect and photopigment bleaching". J. Opt. Soc. Amer. A **2**, 698-704, 1985.
9. Elsner AE, Pokorny J, and Burns SA "Chromaticity discrimination: effects of luminance contrast and spatial frequency". J. Opt. Soc. Amer. A. **3**, 916-920, 1986.
10. Baldinger JB, Doft BH, Burns SA, and Johnson B, "Retinal toxicity of Amphotericin B in vitrectomized versus non-vitrectomized eyes". Brit. J. Ophthalmol. **70**,657-661,1986.
11. Elsner AE, Burns SA, and Pokorny J, "Changes in constant hue loci with spatial frequency". Color Res. and Appl. **12**, 42-50, 1987.
12. Burns SA, Elsner AE, Lobes LA Jr., and Doft BH "A Psychophysical technique for measuring cone photopigment bleaching". Invest. Ophthalmol. and Vis. Sci. **28**,711-717, 1987.
13. Elsner AE, Burns SA, Lobes LA Jr., and Doft BH "Photopigment bleaching abnormalities in diabetes". Invest. Ophthalmol. and Vis. Sci. **28**, 718-723, 1987.
14. Elsner AE, Burns SA, and Lobes LA Jr. "Foveal Cone Pigment Optical Density in Retinitis Pigmentosa". Appl. Optics. **26**,1378-1384, 1987.
15. Burns SA, Elsner AE, and Lobes LA "Photopigment Bleaching in Central Serous Retinopathy". Applied Optics. **27**, 1045-1049, 1988.
16. Warnicki J, Rehkopf P, Curtin DY, Burns SA, Arffa RC, and Stuart J "Corneal topography using computer analyzed rasterstereographic images". Applied Optics. **27**, 1135-1140, 1988.
17. Elsner AE, Berk L, Burns SA, and Rosenberg PR. "Aging and human cone photopigments", J. Opt. Soc. Amer. A. **5**, 2106-2112, 1988.
18. Burns SA, Kreitz M, and Elsner AE "Apparatus Note: A computer controlled, two color, laser-based optical stimulator for vision research". Applied Optics **30**: 2063-2065, 1991.
19. Burns SA, Elsner AE, and Kreitz M "Analysis of Nonlinearities in the Flicker ERG", J. Optom. Vis. Sci. **69**, 95-102, 1992.
20. Elsner AE, Burns SA, Hughes GW, and Webb RH "Reflectometry with a Scanning Laser Ophthalmoscope," Applied Optics, **31**, 3697-3710, 1992.
21. Elsner, AE, Burns SA, and Weiter JJ, "Retinal Densitometry in retinal tears and detachments", Clinical Vision Sciences **7**, 489-500, 1992.
22. Chen, JF, Elsner, AE, Burns, SA, Hansen, RM, Lou, PL, Kwong, KK, Fulton, AB "The Effect of Eye Shape on Retinal Responses". Clin. Vis. Sci., **7**, 521-530, 1992.
23. Elsner, AE, and Burns, SA and Webb RH "Mapping Cone Pigment Optical Density in Humans" J. Opt. Soc. Amer. **10**, 52-58, 1993.

24. Burns SA, and Elsner AE, "Color-matching at high illuminances: photopigment optical density and pupil entry" *J. Opt. Soc. Amer.* **10**, 221-230, 1993.
25. Chang, Y., Burns, SA, and Kreitz, MR, "Red-Green Flicker Photometry and Nonlinearities in the Flicker ERG". *J. Opt. Soc. Amer.* **10**, 1413-1422, 1993.
26. Burns, SA, Wu, S., Delori, F. and Elsner AE "Direct Measurement of Human Cone Photoreceptor Alignment" *J. Opt. Soc. Amer. A.* **12**, 2329-2338, 1995.
27. Wu, S, Burns, SA and Elsner, AE. "Effects of Flicker Adaptation and Temporal Gain Control in the Flicker ERG. *Vision Research* **35**, 2943-2953, 1995.
28. Elsner, AE, Burns SA, Weiter JJ, and Delori, FC "Infra-red imaging of subretinal structures" *Vision Research* **36**,191-205,1996.
29. Delori, FC, and Burns SA. "Estimates of Lens Density from Fundus Reflectometry" *J. Opt. Soc. Amer. A.* **13**,215-226, 1996.
30. Burns, SA, and Elsner, AE. The Response of the Retina at Low Temporal Frequencies. *Journal of the Optical Society of America A.* **13**, 667-672, 1996.
31. Wu, S. and Burns, SA. The effect of adaptation on the temporal response of the retina. *Journal of the Optical Society of America A.* **13**, 649-657, 1996.
32. Wu, S, Burns, SA, Reeves, A. and Elsner AE. "Flicker Brightness Enhancement and Visual Nonlinearity" *Vision Research* **36**, 1573-1582,1996.
33. Wu, S, Burns, SA, Elsner, AE, Eskew, RT, and He, J. "Rapid sensitivity changes on flickering backgrounds: tests of models of light adaptation", *J. Optical Soc. Amer* **14**, 2367-2378, 1997.
34. Burns, SA, Wu, S, He, J, and Elsner, AE "Variations in photoreceptor directionality across the central retina", *J. Optical Society Amer, A* **14**, 2033-2040, 1997.
35. Marcos, S, Burns, SA, and He, J "A Model for cone directionality reflectometric measurements based on scattering." *Journal of the Optical Society of America A* **15**, 2012-2022, 1998.
36. He, JC, Marcos, Webb, RH, and Burns, SA "Measurement of the wave-front aberration of the eye using a fast psychophysical procedure." *Journal of the Optical Society of America A* **15**, 2449 – 2456, 1998.
37. Elsner, AE, Burns, SA, Beausencourt, E, and Weiter, JJ, "Foveal cone photopigment distribution: small alterations associated with macular pigment distributions", *Invest. Ophthalmol. Vis. Sci.* **39**,2394-2404 1998
38. Elsner, AE, Dreher, A, Beausencourt, E, Burns, S, Zhou, Z, and Webb, RH, "Multiply scattered light tomography:vertical cavity surface emitting laser array used for imaging subretinal structures" *Lasers and Light in Ophthalmology*, **8**, 193-202, 1998.

39. Marcos, S, and Burns, S.A. "Cone spacing and waveguide properties from cone directionality measurements" *J. Opt. Soc. Amer. A* **16**, 995-1004, 1999.
40. He, JC, Burns, S.A., and Marcos, S. "Comparison of cone directionality determined by psychophysical and reflectometric techniques" *Journal of the Optical Society, A*, **16**:2363-2369, 1999.
41. Marcos, S, Burns, S.A., Moreno-Barriuso, E, and Navarro, R "A new approach to the study of ocular chromatic aberrations" *Vision Research* 39, 4309-4324, 1999.
42. He, JC, Burns, S.A., and Marcos, S. "Monochromatic Aberrations in the Accommodated Human Eye" *Vision Research* 40, 41-48, 2000.
43. A.E. Elsner, L. Moraes, E. Beausencourt, A. Remky, S.A. Burns, J.J. Weiter, J. P. Walker, G. L. Wing, P. A. Raskauskas and L. M. Kelley "Scanning laser reflectometry of retinal and subretinal tissues" *Optics Express* **6**, 243-250, 2000.
44. Elsner, A.E., Miura, M., Burns, S.A., Beausencourt. E, Kunze C., Kelley, L.M., Walker, J.P., Wing G. Raskauskas P.A., D.C. Fletcher D.C., Zhou Q. and Dreher A. "Multiply scattered light tomography and confocal imaging: detecting neovascularization in age-related macular degeneration" *Optics Express* **7**, 95-106, 2000.
45. Marcos, S, Burns, S.A. "On the symmetry between eyes of wavefront aberration and cone directionality", *Vision Research* **40**, 2437- 2447, 2000.
46. Delori, F. C., D. G. Goger, B. R. Hammond, D. M. Snodderly and S. A. Burns (2001). "Macular pigment density measured by autofluorescence spectrometry: comparison with reflectometry and heterochromatic flicker photometry." *J Opt Soc Am A Opt Image Sci Vis* **18**(6): 1212-30. 2001
47. Moreno-Barriuso E, Marcos, S, Navarro, R, Burns SA "Comparing Laser Ray Tracing, Spatially Resolved Refractometer And Hartmann-Shack Sensor To Measure The Ocular Wave Aberration" *Optometry and Visual Science* **78**,152 – 156, 2001.
48. McLellan JS, Marcos S, and Burns SA "Aging and Wavefront Aberrations" *Investigative Ophthalmology and Visual Science* **42**, 1390-1403, 2001.
49. Marcos S, Burns, SA, Prieto, P, Navarro, RN, Baraibar, B Investigating The Sources For Monochromatic Aberrations And Transverse Chromatic Aberration In Human Eyes *Vision Research* **41** (28) 3861-3871, 2001.
50. A.E. Elsner, Q.Zhou, F. Beck, P.E. Tornambe, S.A. Burns, J.J. Weiter, A.W. Dreher, Detecting AMD with Multiply Scattered Light Tomography. *International Ophthalmology*. **23**: 245-250, 2001.

51. Elsner, A.E., Burns, S.A., and Weiter, J.J. "Cone Photopigment In Older Subjects: Decreased Optical Density In Early Age-Related Macular Degeneration" *J Opt Soc Am A Opt Image Sci Vis* **19**: 215-222, 2002.
52. Burns, SA, Marcos, S, Elsner, AE, Bara, S, "Contrast Improvement for Confocal Retinal Imaging Using Phase Correcting Plates" *Optics Letters*. **27**: 400-402, 2002.
53. Prieto, P.M., Vargas-Martín, F, McLellan, JS, and Burns, SA, "The effect of the polarization on ocular wave aberration measurements". *J Opt Soc Am A Opt Image Sci Vis* **19**: 809-814, 2002.
54. McLellan, J.S. Marcos S, Prieto PM & Burns, SA "Imperfect Optics may be the Eye's Defense Against Chromatic Blur", *Nature* **417**: 174-176, 2002.
55. Yang, Y, Thompson, K, and Burns, SA "Pupil location under mesopic, photopic, and pharmacologically dilated conditions" *Investigative Ophthalmology and Visual Science* **43** 2508-2512, 2002.
56. Webb, RH, Penney, CM, Sobiech, J, Staver, PR, and Burns, SA, "The SRR: a null-seeking aberrometer" *Applied Optics* **42**: 736-744, 2003.
57. Burns, SA, Elsner, AE, Mellem-Kiraila, MB, and Simmons, RB, Improved Contrast of Subretinal Structures using Polarization Analysis, *Invest Ophthalmol Vis Sci* **44**(9): 4061-8., 2003
58. --- Unpublished and deleted

Original Published Proceedings

1. Pokorny J., Smith VC, Burns SA, Elsner AE, and Zaidi Q "Modeling blue-yellow opponency". in *Color 81 Proc. 4th Int. Congr. Int. Color Assoc. (AIC)*, M. Richter ed, page S7. 1981.
2. Smith VC, Burns SA, and Pokorny J "Colorimetric evaluation of urine sugar tests used by diabetic patients". *Docum. Ophthal. Proc. Series*. ed. by G. Verriest, Dr W. Junk Publishers, The Hague, 345- 354, 1982.
3. Burns SA and Elsner AE. "Localizing color vision deficiencies in eye disease" in *Docum. Ophthal. Proc. Series* ed. by B. Drum and G. Verriest, Kluwer Academic Publishers, Dordrecht, 167-180, 1989.
4. Elsner AE, Waldvogel J, and Burns SA "High Illuminance color matching in anomalous trichromacy" in *Docum. Ophthal. Proc. Series* ed. by B. Drum and G. Verriest, Kluwer Academic Publishers, Dordrecht, 57-68, 1989.
5. Elsner AE, Burns SA, Delori FC, and Webb RH "Quantitative Reflectometry with the SLO " *Laser Scanning Ophthalmoscopy and Tomography*. ed. by J.E. Nasemann and R.O.W. Burk, Quintessenz-Verlag, 1990.

6. Burns, S.A., He, J.H., Delori, F.C. and Marcos, S. "Do the cones see light scattered from the deeper retinal layers? *Trends in Optics and Photonics*. ed. By Yager, D. Vol **11**, a1-a4, Optical Society of America, 1997.
7. Elsner, A.E. Zhou, Q. Beck, Tornambe, P.E., Burns, S.A., Weiter J.J., and Dreher, A.W. Detecting AMD with Multiply Scattered Light Tomography, *Int Ophthalmol* 2001;23(4-6):245-50
8. Burns, S.A "The Spatially Resolved Refractometer", *Journal of Refractive Surgery* 16(5): S566-S569.
9. Burns, S. A. and S. Marcos (2000). Evaluating the role of cone directionality in image formation. *OSA Trends in Optics and Photonics*. V. Lakshminarayanan. Washington, D.C., Optical Society of America. *Vol 35, Vision Science and It's Applications: 22-25*.
10. Elsner, A. E., M. Miura, S. A. Burns, E. Beausencourt, C. Kunze, L. M. Kelley, J. P. Walker, G. L. Wing, P. A. Raskauskas, D. C. Fletcher, Q. Zhou and A. W. Dreher (2000). Multiply Scattered Light Tomography and Confocal Imaging: Detecting Neovascularization in Age-Related Macular Degeneration. *OSA Trends in Optics and Photonics*. V. Lakshminarayanan. Washington, D.C., Optical Society of America. *Vol 35, Vision Science and It's Applications: 279-285*.
11. Elsner, A. E., L. Moraes, E. Beausencourt, A. Remky, S. A. Burns, J. J. Weiter, J. P. Walker, G. L. Wing, P. A. Raskauskas and L. M. Kelley (2000). Scanning Laser Reflectometry of Retina and Subretinal Tissues. *OSA Trends in Optics and Photonics*. V. Lakshminarayanan. Washington, D.C., Optical Society of America. *Vol 35, Vision Science and It's Applications: 272-278*.

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1. Burns SA, Elsner AE, Lobes LA, and Doft BH "A psychophysical technique for investigating cone kinetics." *Advances in the noninvasive diagnosis of the visual system*. Technical Digest, Optical Society of America, 1985.
2. Elsner AE, Burns SA, and Lobes LA Cone "Optical Density in Retinitis Pigmentosa." *Noninvasive Assessment of the Visual System*. Technical Digest, Optical Society of America, 1986.
3. Burns, S. A., Elsner, A. E., and Lobes, L. A., Jr. Photopigment bleaching in central serous retinopathy. *Noninvasive Assessment of the Visual System*, Technical Digest, Optical Society of America, 1986.
4. Elsner AE, Timberlake GT, Burns SA, and Kreitz MR, "High Illuminance Perimetry: Photopigment Mechanisms." *Noninvasive Assessment of the Visual System*. Technical Digest, Optical Society of America, 1989.

5. Burns SA, Elsner AE, Fourman SI, and Kreitz MR "The Steady State ERG: Evaluation as a quantitative test of inner retinal damage." Noninvasive Assessment of the Visual System. Technical Digest, Optical Society of America, 1989.
6. Elsner AE, Burns SA, Hughes GW, and Webb RH, "Evaluating the Photoreceptor/RPE Complex with an SLO." Noninvasive Assessment of the Visual System. Technical Digest, Optical Society of America, 1990.
7. Burns SA, Elsner AE, Weiter JJ and Kreitz MR "Cone Photopigment Density in Aging and AMD," Noninvasive Assessment of the Visual System. Technical Digest, Optical Society of America, 1991.
8. Elsner, A.E. Burns, S.A., Kreitz, M.R., and Weiter, J.J. New views of the retina/RPE complex: quantifying sub-retinal pathology, OSA, Techn Digest Ser 1:150-153, 1991
9. Burns SA, Elsner AE, Gorrard JM, Kreitz MR, and Delori FM, "Comparison of Reflectometric and Psychophysical Measures of Cone Orientation." Noninvasive Assessment of the Visual System. Technical Digest, Optical Society of America, 1992.
10. Elsner AE, Burns SA, and Weiter JJ "Rapidly Measuring foveal cone photopigment optical density". Noninvasive Assessment of the Visual System. Technical Digest, Optical Society of America, 1992.
11. Burns SA, Elsner AE, "What Causes Linearity Failure in Color Matching?" Advances in Color Vision. Technical Digest, Optical Society of America, 1992.
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13. Wu, S, Burns, SA, and Elsner, AE, "Flicker Adaptation and Temporal Gain Control in the Retina", Vision Science and its Applications, Optical Society of America, 2, 280-283 1994.
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2. Burns, SA and Webb, RH. "Optical Generation of the Visual Stimulus", In: Bass, M. van Stryland, EW, Williams, DR and Wolfe, WI, (eds) *The Handbook of Optics*, McGraw Hill, New York, 28 1-27, 1994.
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3. Burns, SA, Delori, JC, and He, JC. Back-illuminating the cones: is light from the RPE guided? *Invest. Ophthalmol and Vis. Sci* 38, 1997

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8. Marcos, S, Burns, SA, and He JC, "A scattering model for photoreceptor directionality reflectometric measurements." Optical Society of America, Technical Digest Series, 1997
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11. He, J.C., Burns SA, and Marcos, S. "The change in aberration of the human eye with accommodation" Invest Ophthalmol. Vis. Sci 39, 1998.
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31. McLellan, JS, Marcos, S, Burns SA, and Prieto PM "Are Wavefront Aberrations Random?" Optical Society of America, Technical Digest Series, p 96, 2000
32. Prieto, P., Vargas-Martín, F., McLellan, JS, Burns, SA "Does Polarization Affect Ocular Wave Aberration Estimates?" Adaptive Optics: International Symposium: From telescopes to the Human Eye, Murcia, Spain
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37. Mellem-Kairala MB, Elsner AE, Burns, SA and Simmons RB, "Polarimetric Analysis of the Peripapillary Hyperpigmentation in Glaucoma Patients" Invest Ophthalmol. Vis. Sci (Suppl) 43, 2002.
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41. McLellan, J.S., Marcos, S, and Burns, SA "Wave Aberrations are not Random: Evidence from Pre- and Post-Surgical Wavefronts talk presented at ARVO, 2003.

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44. Ferguson, D.; Hammer, D. X. Elsner, AE. Burns, SA, Webb,RH, Wide-field Doppler flowmetry with the tracking scanning laser ophthalmoscope (TSLO), SPIE, Photonics West, 2004.

Other Publications/Editorials

1. Elsner, A. E. and Burns, S.A. "The value of color vision testing" Ophthalmology and Otolaryngology News for Nurses, 2, 1984.
2. Applegate RA, Johnson MA, and Burns SA "Noninvasive Assessment of the Visual System Features in Applied Optics: Goals and History," Applied Optics **27**:1013, 1988.
3. Burns SA, Applegate RA, and Johnson MA "Noninvasive Assessment of the Visual System: Introduction by the Feature Editors," Applied Optics **28**, 1058-1060, 1989.
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5. Applegate RA, Johnson MA, and Burns SA "Is Biomedical Research a National Priority? Guest Editorial." Applied Optics **30**, 1991.
6. Applegate RA, Burns SA, Johnson, MA, Sheedy, JE, and Rosenberg, R. "Noninvasive assessment of the visual system and ophthalmic and visual optics: an introduction to the joint vision features." Applied Optics **31**, 3577-3578, 1992.
7. Applegate RA, Burns SA, Johnson, MA "Introduction to the Noninvasive Assessment of the Visual System Feature Issue," JOSA **A**, 1993.
8. Elsner, AE, Burns SA, Zenzie HH, Moulton PF "There's Hope in Sight" Photonics Spectra: (6) 99-102 JUN 1993
9. Burns, SA, Ediger, M, and Richards-Kortum, R. "Introduction: Optical Technology in Medicine and Biology" Applied Optics, **35**, 3313, 1996.
10. Baer, T., Boas, D, Burns, SA, Deutsch, T, Ediger, W, French, P, Fujimoto, J, Johnson, M, Svanberg, S, Yodh, A, "OSA/SPIE Unification" Optics and Photonics News, p 6. February, 1999

Formal Seminars and Invited Lectures.

1. . "Null coordinates for the opponent color channels," Burns, S.A., Elsner, A. E., Pokorny, J. and Smith, V. C. presented at the European Conference on Visual Perception, Noordwijkerhout, the Netherlands, 1979.
2. "Chromatic brightness for lights of constant luminance," Burns, S.A., Smith, V.C., Pokorny, J., and Elsner, A.E. presented at the European Conference on Visual Perception, Noordwijkerhout, the Netherlands, 1979.
3. "Non-Linearities in Human Color Vision" Invited lecture at the Carnegie- Mellon University, Dept. of Biomedical Engineering, 1979
4. "The color match area effect at high illuminances" Invited lecture at the University of Chicago Vision Seminars, 1982.
5. "Cone Photopigment Kinetics: Psychophysical Measurements" Lecture given at The Johns Hopkins University School of Medicine Vision Seminars., 1982
6. "Photopigment Kinetics Invited lecture at the Eye Research Laboratories, The University of Chicago, 1982.
7. Invited lecture on cone pigment kinetics in retinal disease presented with A, Elsner at The Johns Hopkins University School of Medicine Vision Seminars, 1983.
8. "Color Deficiencies" invited lecture given to the Eastern Regional Orthoptics Meeting, 1983
9. "The value of color vision testing" invited lecture presented to the National Association of Vision Program Consultants, 1983
10. "Electrophysiological assessment of visual function" invited lecture given to the Pittsburgh Ophthalmological Society annual Meeting, 1985
11. "Cone Photopigment Kinetics: Noninvasive Measurements in Humans" Invited Lecture at the Neurological Sciences Institute, Portland, OR., 1985
12. "Clinical investigations of human cone photopigment kinetics using color matching," Elsner, A. E., Burns, S. A., and Lobes, L. A., Jr. presented at "Workshop: Fundus reflectometry and its clinical applications," Utrecht, the Netherlands, 1986.
13. "Psychophysical techniques for measuring photopigment kinetics," Burns, S. A., Elsner, A. E., and Lobes, L. A., Jr. presented at "Workshop: Fundus reflectometry and its clinical applications," the Netherlands, 1986.
14. "Dynamic Aspects of Cone Photopigment Kinetics" Lecture presented at The University of Washington Vision Seminars, Seattle, WA., 1986

15. "Localizing color vision deficiencies in eye disease" Invited lecture at the meeting of the International Research Group on Color Vision Deficiencies., Annapolis, MD., 1987
16. "The first step in Vision, Psychophysical Measurements", lecture presented to the Vision Seminar Series, MIT.
17. "Analysis of Nonlinearities in the Flicker ERG" Invited Lecture to the American Academy of Optometry.
18. "Nonlinearities in Flicker Electroretinograms" Invited presentation to the Annual Meeting of the Optical Society of America.
19. "Research on Macular Degeneration" Public Lecture in Portland, ME, October, 1990
20. "Photopigment Changes in Aging and ARMD" paper presented with A.E. Elsner MR Kreitz, and J.J. Weiter at the International Meeting on Age Related Macular Degeneration, 1990, Williamstown, Mass.
21. "Temporal Nonlinearities in the Visual System comparison of Psychophysical and Electrophysiological Measurements". presented to Wilmer Vision Seminar, Baltimore MD, 1991.
22. "Investigating Retinal Processing using the flicker ERG" Smith-Kettlewell Eye Research Colloquia, 1991.
23. "New Approaches to the Study of Age Related Macular Degeneration" Presented at the 639th meeting of the New England Ophthalmological Society, 1992.
24. "Using Temporal Nonlinearities to Investigate Retinal Processing" Invited lecture presented to the OSA Annual Meeting, Albuquerque NM, 1992.
25. "The Aging Retina" Oxyopia lecture given at Berkeley vision seminar, UC Berkeley, 1993.
26. "Measurements of Cone Photopigment Density and Kinetics in Normals and in Patients with Retinal Disease" invited lecture at The Ohio State Universities Fry luncheons, 1994
27. "Noninvasive Measurement of Human Cone Photopigment Kinetics" invited lecture at the Ophthalmology Research Series, Brigham and Women's Hospital, April, 1995.
28. "Objective Measurement of Human Cone Photoreceptor Alignment" presented at the New England College of Optometry, June 1995.
29. "Investigations of cone photoreceptor kinetics and alignment in normals and patients." presented at the Schepens Eye Research Institutes Lecture Series, 1995.
30. Organizer of Advanced Workshop "Orthogonality of Color Spaces", Annual Meeting, Optical Society of America, 1995.

31. "Using response nonlinearities to investigate early retinal processing", SERIES lecture, September, 1995
32. "Optical Measurements of Photoreceptor Alignment" University of Illinois at Chicago, May, 1996
33. "The variation in the optical properties of human cones across the retina" New England Chapter of the Optical Society of America, December, 1996
34. "Variation in Optical Properties of the Photoreceptors across the retina". Vision Lunch, Northeastern University, January, 1997.
35. "Photoreceptor Alignment" , SERIES lecture, February, 1997
36. "Dynamics of the Flicker ERG and what they tell you about vision" invited talk presented at the Annual Meeting of the Optical Society of America, 1997.
37. "Cone Photopigment Directionality and the Optical Performance of the Eye" presented at the University of Chicago Vision Series, January, 1998.
38. "Cone Function in Aging and AMD" presented at The University of Chicago, Department of Ophthalmology, January, 1998.
39. Burns, SA. Does Cone Directionality Improve Vision? SERIES Seminar, Schepens Eye Research Institute, April, 1998
40. Burns SA, Marcos S, He JC and Elsner AE., Utilizing optics to measure the changes in cone directionality and photopigment absorption across the fovea" Invited talk at the Berkeley School of Optometry 75th Anniversary Symposium. December, 1998.
41. Marcos S, Burns SA. and Navarro R Measuring foveal photoreceptor properties using scattering theory and speckle interferometry, Invited talk at the Berkeley School of Optometry 75th Anniversary Symposium. December, 1998
42. Burns, SA, "Cone Coverage and the efficiency of the cone array" SERIES Seminar, The Schepens Eye Research Institute, 1999
43. Burns, SA, "Aging and Cone Function" ARVO Special Interested Group Presentation, 1999.
44. Burns, SA, "Computational Approaches to analyzing three dimensional data sets in MATLAB", ARVO Special Interest Group on Scanning Laser Ophthalmoscopes, 1999.
45. OSA/SPIE Unification. Invited Panel Discussant, OSA New England Chapter, 1999
46. Burns, S.A. "Creating a retinal Image: Do Photoreceptors compensate for bad optics" Massachusetts Eye and Ear Infirmary, 1999.

47. Burns, SA, "Principles of Spatially Resolved Refractometry" invited talk presented at the 1st International Congress of Wavefront Sensing and Aberration Free Refractive Correction, Santa Fe, NM, 2000.
48. Burns, SA "Is there more to Refractive Development than Emmetropization?", SERIES Seminar, 2000.
49. Burns, SA "Evaluating the Role of Cone Directionality in Image Formation" presented at the Institute of Optics, Madrid, Spain. June, 2000.
50. Burns, SA, "The Wave Aberrations of the Eye", New England Medical Center, May, 2001.
51. Burns, SA, "The Optical Imperfections of the Eye: Nature's Design, or Surgeon's Opportunity?" SERIES Seminar, July, 2001.
52. Burns, SA, "Calculating Retinal Image Quality", Invited workshop presentation at the OSA Annual Meeting, Long Beach, CA, 2001.
53. Burns, SA, "Changes to the Optics of the Eye: Aging, Wavelength, and other Issues" SERIES Seminar, December, 2001.
54. Burns, SA, "The Wave Aberrations of the Eye: Are they Random Errors?", Wellman Institute Photomedicine Series, April, 2002.
55. Burns, SA "Advances in Retinal Imaging" invited presentation at "Engineering the Eye", Center for Visual Sciences, Rochester, NY, June 2002.
56. Burns, SA "Frontiers in Retinal Imaging", Invited Talk presented at Frontiers in Imaging workshop of the Optical Society of America, Orlando FL, October 2002.
57. Burns, SA "Photoreceptor directionality and wave aberrations, are the optical variations random?" invited lecture at Advances in Adaptive Optics, International Symposium, Santander, Spain, October, 2002.
58. Burns, SA "New Imaging Strategies for Imaging retinal pathology" invited lecture to be presented at CISC, Madrid, Spain, October, 2002.
59. Burns, SA "Retinal Imaging with New Modalities" invited lecture at University of Murcia, Murcia, Spain, October, 2002.
60. Burns, SA "Introduction to the Retina" Lecture presented to imaging interest group, University of Houston, 2002
61. Burns, SA "The limits to visual corrections" invited talk presented at the 4th International Congress of Wavefront Sensing and Aberration Free Refractive Correction, San Francisco, CA, 2003.

62. Burns, SA "Strategies for Retinal Imaging in the Aged Retina and Early AMD" invited talk presented at the 50th Anniversary Celebration, University of Houston School of Optometry, March, 2003
63. Burns, SA "The Wavefront Aberrations of the Eye, Are they Random Errors?" invited talk presented at the Berkeley School of Optometry. March, 2003.
64. Burns, SA, "Determining Retinal Image Quality: The Influence of Polychromatic Light and Photoreceptor Directionality." Presented at Indiana University, March 2003.
65. Burns, SA "Visual Optics in the Real World" SERIES Seminar, 2003
66. Burns, SA "Wavefront Aberrations" Cornea Seminar Series, Massachusetts Eye and Ear Infirmary, 2004.
67. Burns, SA "What are the Optimal Aberrations" invited talk presented at the 5th International Congress of Wavefront Sensing and Aberration Free Refractive Correction, Whistler, BC, 2004.

OTHER

NIH/FDA regional workshop on Protection of Human Subjects, Philadelphia, PA, 1992.

Abstracts (prior to 1997)

1. Burns S A and Ingling CR Jr. Is the blue cone in the achromatic channel? Invest. Ophthalmol. Suppl. 17, 1978.
2. Burns SA Duration thresholds for lights of varying purity. J. Opt. Soc. Am., 68, 1399, 1978.
3. Burns SA, Elsner AE, Pokorny J., and Smith VC Null co-ordinates for the opponent color channels. J. Opt. Soc. Am. 69, 1406, 1979.
4. Burns SA, Smith VC, Pokorny J, and Elsner AE, Chromatic brightness for lights of constant luminance. J. Opt. Soc. Am., 69, 1406, 1979.
5. Elsner AE, Burns SA, Pokorny, J. The Abney effect as a function of spatial frequency. Invest. Ophthalmol. Suppl. 18, 93, 1979.
6. Burns SA, Elsner AE, and Quick RF, Jr. Interactions of chromatic and achromatic spatial mechanisms. J. Opt. Soc. Am., 71, 1571, 1981.
7. Burns, S. A., Elsner, A. E., The color match area effect at high illuminance. J. Opt. Soc. Am. 72, 1982.
8. Burns, S. A., Elsner, A. E., Lobes, L. A., and Doft BH Cone photopigment kinetics in Retinal Disease. J. Opt. Soc. Am. 73, 1983.
9. Burns SA and Elsner AE The extended Rayleigh match at high illuminances. J. Opt. Soc. Amer. A, 1, 1984.
10. Elsner AE, Burns SB, Lobes LA Dynamic color matching and photopigment kinetics. J. Opt. Soc. Am. A, 1, 1984.
11. Elsner AE, Burns SA, Lobes LA, and Doft BH Photopigment concentration, light and dark adaptation. Investigative Ophthalmology and Visual Science Suppl. 25, 311, 1984.
12. Burns SA and Elsner AE Cone photopigment kinetics estimated by color matching. Investigative Ophthalmology and Visual Science Suppl. 25, 146, 1984.
13. Wall III, C., Elsner AE, and Burns SA Does the VOR affect voluntary saccades? Investigative Ophthalmology and Visual Science Suppl., 25, 231, 1984.
14. Baldinger, J.D., Doft BH, Burns SA, Johnson, B.L., and Van- Patten, D. Retinal toxicity after amphotericin-B injection. Investgative Ophthalmology and Visual Science Suppl. 25, 311, 1984.
15. Elsner AE, Pokorny, J.P., and Burns SA Does luminance contrast affect chromaticity discrimination? J. Opt. Soc. Am. A, 2:13, 1985.

16. Burns SA, and Elsner AE Cone Photopigment Kinetics: Measurements by Color Matching. *J. Opt. Soc. Am.* 2:23, 1985.
17. Burns SA, and Elsner AE Mechanisms controlling high illuminance color matches. *Investigative Ophthalmology and Visual Sciences Suppl.*,26:182, 1985.
18. Burns SA, Elsner AE, and Lobes LA Jr. Cone pigment optical density in central serous retinopathy. *Investigative Ophthalmology and Visual Sciences Suppl.*, 27: 311, 1986.
19. Elsner AE, and Burns SA Factors influencing photopigment kinetics. *Investigative Ophthalmology and Visual Sciences Suppl.*, 27:74, 1986.
20. Burns SA, Elsner AE, Berk, L., and Rosenberg, P. Aging and human cone photopigments. *J. Opt. Soc. Am.* 3: 63, 1986.
21. Burns SA, and Elsner AE, Psychophysical techniques for measuring photopigment kinetics, presented at "Workshop: Fundus reflectometry and its clinical applications" Utrecht, The Netherlands, 1986.
22. Elsner AE, Burns SA, and Lobes LA Jr., Clinical investigations of human cone photopigment kinetics using color matching. presented at "Workshop: Fundus reflectometry and its clinical applications" Utrecht, The Netherlands, 1986.
23. Elsner AE, Burns SA, and Lobes LA Jr. Cone function deficits in patients with good visual acuity. *Invest. Ophthalmol. Vis Sci*, 28:128, 1987.
24. Burns SA, and Elsner AE Inner retinal contributions to the steady-state ERG. *Invest Ophthalmol. Vis Sci*, 28, 237, 1987.
25. Warnicki J, Rehkopf P, Curtin DY, Burns SA, Arffa RC, Stuart J Corneal Topography using raster stereography. *Invest Ophthalmol. Vis Sci*, 28, 223, 1987.
26. Elsner AE and Burns SA, Classes of Color Normal Observers. *J. Opt. Soc. Amer.* 4, p123, 1988
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